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ABSTRACT

The organization, scope, and activities of the Indiana Occupational Competency Testing Center were expanded to accommodate the requirements of the new Occupational Specialist Certificate for secondary vocational teacher credentialling. A pilot project involved three regional sites in the state. The director of the host area site acted as area coordinator with responsibilities in promotion, selection of test candidates, facilities preparation, counseling, and supervision. In each area center, five common tests were offered for conditionally certified teachers: auto body repair, auto mechanics, machine trades, carpentry, and welding. Three or four additional occupational tests were offered at each site. Tests were offered in 15 different occupational areas. Forty-eight persons were involved in the pilot written and performance tests. On written and performance tests, 33 and 29 pilot test candidates, respectively, scored above the national mean. A cost analysis of the test operation using the proposed model found that the cost of operation was approximately $700 per candidate. Recommendations were made for retention of the model, use of National Occupational Competency Testing Institute tests to assess the occupational competence of occupational specialist candidates, annual workshops for training of performance test examiners, and state funding. (Appendixes include a list of performance examiners, evaluation sheets, and a third-party assessment.) (YLB)

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IN88PD03

Final Report

of

PROFESSIONAL DEVELOPMENT FOR OCCUPATIONAL SPECIALIST: OCCUPATIONAL COMPETENCY TESTING

ED333242

June 30, 1990

Project Number 88-4741

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Professional Development for Occupational Specialist:

Occupational Competency Testing

EXECUTIVE SUMMARY

The primary purpose of this project was to expand the organization, scope, and activities of the Indiana Occupational Competency Testing Center in order to accommodate the requirements of the new Occupational Specialist Certificate for secondary vocational teacher credentialing. The procedure utilized involved the conception of a model plan and organization, evaluation by a substantial, practical pilot test, revision of plan as needed, development of a preliminary operational manual, an analysis of operational costs, and making recommendations to the Indiana Department of Education regarding operation and funding to meet present and future needs.

In order to gain experience and data relevant to these recommendations, a fifteen-month period of study, research, and practicum was supported by the Indiana Board of Education. Quarterly reports were submitted to that board. It is important to record that the funded project has provided an opportunity to:

1. Study the availability and nature of occupational competency tests having both a written and practical performance component which matches the occupational areas approved for the secondary vocational programs of Indiana.
2. Compile an occupational competency test file and recommend a testing scheme (NOCTI tests, other tests, individual procedures) to adequately provide for the requirements of "1." above.

3. Develop a model for the organization, administration, and coordination of the Indiana Occupational Competency Testing Center with assistance of an advisory committee representing Indiana's vocational teacher education participants, the Indiana Department of Education, area vocational school administration, and industry.
4. Train a cadre of master occupational performance examiners for selected NOCTI tests.
5. Identify and certify performance testing laboratories for occupational areas to be included in the pilot test of the expanded organization.
6. Pilot the expanded center model involving multiple test sites (north, central, and south), and a variety of occupational areas.
7. Analyze pilot program outcomes in terms of organization, administration, coordination, and outcomes--and make revisions as required.
8. Develop an operational manual for operation and make recommendations for financial support.

The project and study included a cost analysis of the NOCTI test operation utilizing the proposed model. It was found that the cost of operation was approximately $700 per candidate in a situation where two persons were tested in most occupations. It was further estimated that the cost of operating the Indiana Occupational Competency Center in 1990-91 in a situation where 50 candidates would be tested in one general testing session, involving 12 different occupations, would be

approximately $35,000.

A series of recommendations have bene offered to the Indiana Department of Education as a result of learnings from experiences afforded by this project. Their essence is presented below in abbreviated form.

1. The proposed and piloted model of the Indiana Occupational Competency Testing Center should be retained, with some minor revisions.
2. NOCTI tests should be utilized as the major tool for assessing the occupational competency of occupational specialist candidates. State/national tests (which provide both written and performance evaluations) resulting in state licensure of tradesmen, technicians, and professionals would be acceptable in specified endorsement areas. Test procedures devised by university personnel, advisory committee members, and occupational peers would be utilized in specified endorsement areas.
3. Passing score criterion for NOCTI test performance should be established at T-score of 40 or better on both written and performance examinations.
4. A workshop for the training of performance test examiners/facilitators should be conducted annually by the Indiana Occupational Competency Testing Center (IOCTC).
5. The IOCTC should establish and maintain an advisory committee to provide the Center director advice, information, and support.

6. The State should provide funding to support the IOCTC. Candidates should pay a substantial test fee to cover all or most direct costs of testing--within $150 and $250 range.

Professional Development for Occupational Specialist:

Occupational Competency Testing

TECHNICAL REPORT

I. Introduction

Quarterly reports previously submitted have provided a chronology of the project activities leading up to the pilot-run of the expanded model of the Indiana occupational Competency Testing Center. This report provides a summary of the pilot activities and outcomes, major findings resulting from the series of activities, cost estimates for future operation, and recommendations for continued operation.

II. NOCTI Pilot-Run

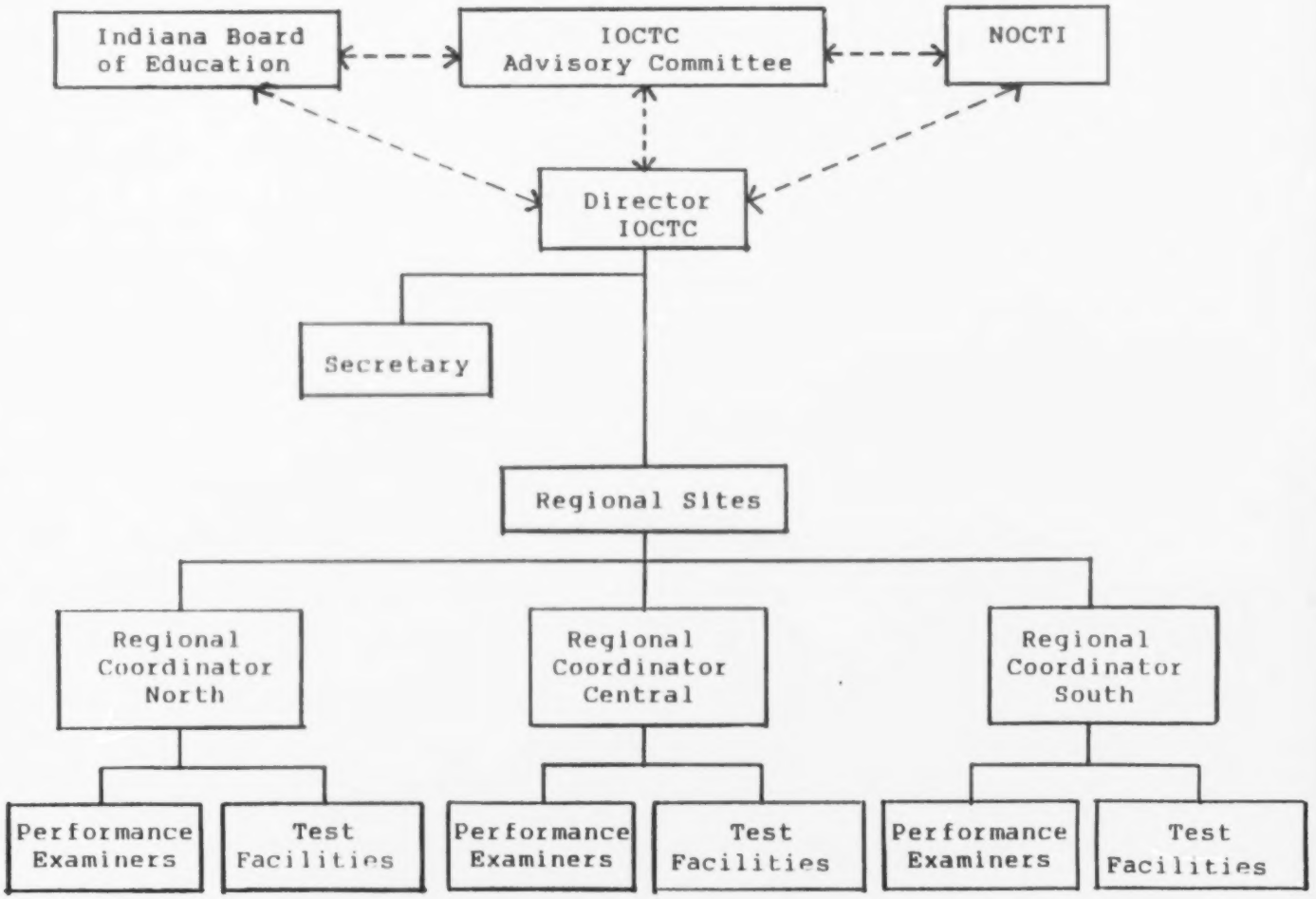
With input from the Advisory Committee, it was decided that the pilot program should involve three regional sites in the State. In each case, one area vocational school would be designated as the focus of the activity, while recognizing that in every situation the school of focus would not be able to offer facilities for all of performance testing. The regional test sites were Elkhart Career Center--northern region, Ben Davis High School--central region, and Charles A. Prosser (New Albany)--southern region. In each case, the director of the host area site was designated as the area coordinator with responsibilities in promotion, selection of test candidates, facilities preparation, counselling and supervision (see Figure 1).

Figure 1

ORGANIZATION CHART

OF

INDIANA OCCUPATIONAL COMPETENCY TESTING CENTER



It was agreed that in each area center five common tests would be offered. These are tests which represent occupation areas that have had a large number of conditionally certified teachers in years past, namely Auto Body Repair, Auto Mechanics, Machine Trades, Carpentry (building trades), and Welding. In each case, three or four additional occupational tests would be offered. As a result, tests were offered in 15 different occupational areas, as shown in Table I.

In cases where the candidates were pursuing the Standard Certification rather than Occupational Specialist, they opted to take only the required written examination. Such was the case in carpentry (1 case), electronic technology (2 cases), and plumbing (1 case). As a result, 48 persons were involved in pilot tests covering 15 different occupations. In 44 out of 48 cases, the candidates took both the written and performance tests.

Performance tests were facilitated and administered by "Certified Master Performance Examiners/Facilitators", each of whom earned that title by attending the Performance Examiners Workshop conducted at Purdue University prior to the pilot run. A listing of the Certified Master Performance Examiners/Facilitators is found in Appendix A.

TABLE 1

Pilot NOCTI Tests Offered by Regional Sites

Occupation	Number Tested North	Central	South	Total
Auto Body	2	2	2	6
Auto Mechanics	2	2	2	6
Carpentry	2	3	2	7
Commercial Photography	1	0	0	1
Computer Technology	0	2	2	4
Diesel Engine Repair	0	2	0	2
Electrical Installation	0	0	2	2
Electronics Technology	3	0	0	3
Machine Drafting	2	0	0	2
Machine Trades	1	0	2	3
Plumbing	0	1	0	1
Printing (Offset)	0	0	2	2
Quantity Foods Preparation	0	2	0	2
Small Engine Repair	1	0	0	1
Welding	2	2	2	6
Total Candidates	17	15	16	48
15 Total Occupations	9	8	8	

Performance examination facilities were inspected and approved by the project director and associate director. This involved a visit to the proposed shop or laboratory, noting the general atmosphere/environment, determining the adequacy of equipment-tools-apparatus materials in terms of test requirements. A listing of "Certified Performance Test Facilities" is found in Appendix B.

Written tests were administered at each of the area test sites--north, central, and south. The written tests were monitored by the project director and associate director on Friday evening prior to the performance tests which were offered on Saturday.

The director and associate director, area coordinator, and a member(s) of the Advisory Committee (see Appendix H) observed the testing program in action. The Advisory Committee member had an assigned responsibility for evaluation. Each completed an evaluation form for each test--in progress--visited. A copy of form is found in Appendix C.

Input was also received from the candidates. On completion of the performance test, each candidate was asked to complete an evaluation form, a copy of which is found in Appendix D. With these observations and evaluations, valuable information has been gathered, which will be useful in future administrations of NOCTI tests.

On completion of the testing, the area coordinator collected the score sheets, test manuals, test artifacts, and any materials

which might violate test security requirements, and delivered same to the project director. Ratings an score sheets were transposed to scan sheets which we sent to NOCTI headquarters for scoring and statistical treatment. All test materials used were returned to NOCTI, as well.

In about 10 days, test results were received by the project director. Utilizing data provided by NOCTI on candidate score sheets, a report was made to candidates on their test performance.

In order that there would be a common scale for all candidates with no negative score, raw scores were transposed to a T-score scale. The T-score scale is one which has a mean of 50 and a standard deviation of 10. By using this scheme, one can interpret the cut-off for meeting credit or licensure requirement as T-score of 40 (-1 standard deviation) or better. See Appendix E and F for report form and interpretation, respectively.

In general, the pilot test candidates performed well. Their T-scores are presented in the following table in a random order.

TABLE 2

Earned T-Scores by Occupation

Candidate	Written Exam T-Score	Performance Exam T-Score
AUTO BODY REPAIR		
a	63.5	47.5
b	54.6	66.9
c	57.1	43.4
d	65.4	42.4
e	60.2	34.2
f	64.7	66.6
AUTO MECHANIC		
a	54.8	61.8
b	34.9	32.7
c	48.7	57.3
d	65.0	64.8
e	58.1	61.8
f	56.4	61.1
CARPENTRY		
a	48.8	58.9
b	41.9	25.2
c	63.1	46.4
d	61.5	49.9
e	58.1	69.3
f	53.8	24.6
COMMERCIAL PHOTOGRAPHY		
a	59.5	50.0
COMPUTER TECHNOLOGY		
a	30.0	27.1
b	58.1	57.9
c	53.6	39.2
d	40.1	60.5
DIESEL ENGINE REPAIR		
a	26.0	52.6
b	58.6	70.7

TABLE 2 (continued)

Earned T-Scores by Occupation

ELECTRICAL INSTALLATION		
a	49.6	61.4
b	52.3	58.2
ELECTRONICS TECHNOLOGY		
a	57.9	54.0
b	57.1	--
c	65.7	--
MACHINE DRAFTING		
a	58.7	48.3
b	48.7	47.7
MACHINE TRADES		
a	45.4	65.4
b	56.0	62.4
c	55.5	60.3
PLUMBING		
a	63.6	--
PRINTING (OFFSET)		
a	55.4	60.7
b	33.5	56.6
QUANTITY FOODS PREPARATION		
a	52.2	68.8
b	42.4	65.9
SMALL ENGINE REPAIR		
a	77.7	101.9
WELDING		
a	43.4	46.3
b	63.7	52.4
c	69.7	49.0
d	44.0	51.4
e	61.0	57.2
f	67.0	60.7

In comparing pilot-run candidates performances with the National means, Indiana performance is encouraging. In case of the written tests, 33 of 48 (69%) scored above the national mean. Likewise, on the performance tests, 29 of 45 (64%) scored above the national mean. Using the criterion established for NOCTI performance for candidates, for the Standard Certificate in Trade and Industry in Indiana (T-score of 40 or better on the written test), only 4 out of the 48 (8%) would have been found deficient; while 6 out of 45 (13%) would have failed to measure up when both the written and performance tests were considered while using the same cut-off criterion. In the latter case, it should be noted that all of the performance examiners, while all had been trained, were first-timers on the job.

All in all, the pilot-run operated smoothly and efficiently. This is borne out by observers, evaluators, candidates, and test proctors. The experience also produced some findings which can help improve operations in the future.

III. Findings and Insights

The pilot-run, activities and study leading up to it have resulted in some findings and insights which should be noted--and some should serve as a basis for recommendations:

1. Vocational teachers and administrators are not adequately informed about the requirements of occupational competency testing as provided in the rules and standards relating to Occupational Specialist I, II, and III.

2. NOCTI provides a "Certificate of Competence" which can be given to persons who have "successfully completed the written and performance tests" in their occupation. This is of great interest to the candidates who have taken the test.
3. Teacher educators, local vocational administrators, experienced vocational-technical education teachers, and industrial personnel are willing to contribute time, expertise, and a variety of resources to the occupational competency effort. Certain intensive activities are worthy of and will require reasonable compensation.
4. Experienced practitioners in the trade and technical occupations are quick to identify inconsistencies, incorrect and outdated material, and other problems in the testing materials of their particular occupation. NOCTI has received a goodly number of suggestions which will be useful when revisions of certain tests are being accomplished. Albeit, all criticisms and suggestions are not necessarily valid!
5. Organization for testing utilizing area vocational facilities and instructors in the performance testing element poses some potential problems. Situations did arise in the pilot program in which a candidate was evaluated by his office-mate, senior instructor in his occupational specialty. This will have to be controlled in the future.
6. Estimates of the number of occupational specialists requiring occupational testing for 1989-1990, and years beyond appear to have been drastically inflated. Also, the number

of persons who would demonstrate their competency by a "state board" type of examination was significantly above estimates based historical data. Whereas, it was anticipated that 100-140 persons might be tested annually, it now appears that 40-60 is a much better estimate.

7. The workshop for the training of performance evaluators was most useful and productive. Each year, it will be necessary to induct new performance examiners into service and to refresh seasoned examiners to techniques and expectations. It should not be necessary to hire consultants for this in the future.

8. A three-fold thrust will be needed to provide the testing required for occupational specialists. The large majority can be handled by NOCTI tests and state/national tests utilized for trade, technical, and professional licensure. Test by committee is a third option which must be considered for the few not covered by the established normal testing programs (see Appendix G).

9. The work load involved in the operation of the Indiana Occupational Competency Testing Center will be drastically increased due to the requirement for testing required by the Occupational Specialist Rule. The load is now such that the director can not be expected to take it "out of his hide", and the agency which houses the Center (Purdue University, School of Technology) can not be expected to assume these costs. At the same time, there is concern on the part of

the teachers and their administrators about the cost of the test to the candidates.

10. The NOCTI tests were most effective in sorting out those persons who were not qualified to teach a particular subject. There were two cases in particular which illustrated this fact. One was a case where a candidate chose to take a test "just to see how I could measure up" when the candidate's experience was in a related, peripheral occupation. Another was a person who had left the general occupation nine years ago to practice a specialty in his trade. In each case, the NOCTI tests (Computer Technology and Auto Mechanics, respectively) delivered scores which clearly announced a lack of competing. See Table 2, Auto Mechanics, "b", and Computer Technology, "a".

IV. Analysis of Costs of NOCTI Test Administration

This analysis is based on data from the operation of the pilot program and from experience in operation of the Indiana Occupational Competency Testing Center over the past 12 years. It is based on the assumption that:

1. A total of 50 Occupational Specialists candidates will have to be tested per year.
2. The cost of NOCTI tests and services will remain constant.
3. The operation of the NOCTI testing program and special testing will require .25 FTE for state coordination and .25 FTE for secretarial services.

4. Performance test facilitators/examiners will be paid a stipend of $125.00 for setting up and conducting a test for one or more (up to three) candidates.
5. The average cost of materials and supplies per candidate will be $24.00.
6. NOCTI tests will be administered in 12 different occupational areas per year on the average. In eight of those occupational areas, there will be two or more candidates.
7. A workshop for performance examiners/facilitators will be conducted annually for up to 20 persons.
8. A stipend will be paid for each regional coordinator of planning and operations at each regional test site, based on the formula: occupations tested x $50.00 + number tested x $10.00.

Based upon the above assumptions, the following estimates of cost for operation of one "general" test administration per year is submitted:

A. Cost of center operation

1) Staff	
Director $40, 000 x .25	$10,000
Secretary, $16,000 x .25	4,000
Fringe benefits--director, $10,000 x .31	3,100
Fringe benefits--secretary, $4,000 x .31	1,240
2) Travel, per diem, lodging	700

3)	Communications--phone, postage	600
4)	Supplies	300
	Total	$19,940

B. Cost of testing

1)	Test and test services, 50 x $130	$ 6,500
2)	Consumable materials and supplies, 50 x $24.00	1,200
3)	Regional coordination, 12 x $50.00 + 50 x $10.00	1,100
4)	Performance examiners, 25 x $125.00	3,125
	Total	$11,925

C. Cost of performance examiners workshop

1)	Honoraria, 20 x $50.00	$ 1,000
2)	Travel, per diem, lodging, 20 x $87.00	1,740
	Total	$ 2,740
	Grand Total	$34,605

V. Options for Funding

The estimated cost of sections A, B, and C of is $34,605. The Center operations (A) is expected to cost about $20,000 annually. The actual cost of testing 50 persons annually (assuming two candidates for each test) would be approximately $12,000, and the cost of the performance examiners workshop would be approximately $3,000. The following are some options for sharing these costs:

A. Option 1. This option provides that the Indiana Department of Education will support the total cost of the center operation (A), the performance examiners workshop (C), the cost of regional coordination (B-3), and the cost of the performance examiners (B-4). This would leave the cost of the NOCTI test and the average cost of the consumable materials to the candidate.

B. Option 2. This option provides that the candidate will pay all the direct cost of the testing including B-1,2, 3,4. The Indiana Department of Education supports the total cost of center operation and the performance examiners workshop.

C. Option 3. This option provides that the Indiana Department of Education supports the cost of the Center operation, only. All costs relating to the actual testing process would be financial through test fees. The particulars of each option are shown in Table 3.

TABLE 3

Cost Sharing by Options

		Indiana Department of Education			Candidate		
		Opt. 1	Opt. 2	Opt. 3	Opt. 1	Opt. 2	Opt. 3
A. Cost of Center Operation							
1. Staff	$18,340	18,340	18,340	18,340	0	0	0
2. Travel	700	700	700	700	0	0	0
3. Communications	600	600	600	600	0	0	0
4. Supplies	300	300	300	300	0	0	0
	$19,940	19,940	19,940	19,940	0	0	0
B. Cost of Testing							
1. Tests/Serv.	$ 6,500	0	0	0	6,500	6,500	6,500
2. Materials	1,200	0	0	0	1,200	1,200	1,200
3. Coordination	1,100	1,100	0	0	0	1,100	1,100
4. Perf. Examin.	3,125	3,125	0	0	0	3,125	3,125
	$11,925	4,225	0	0	7,700	11,925	11,925
C. Cost of Workshop							
1. Honoraria	$ 1,000	1,000	1,000	0	0	0	1,000
2. Travel/Costs	1,740	1,740	1,740	0	0	0	1,740
	$ 2,740	2,740	2,740	0	0	0	2,740
Total Cost	$34,605	26,905	22,680	19,940	7,700	11,925	14,665
Cost Share Per Candidate	(100%) $692.10	(78%) $538.10	(66%) $453.60	(58%) $398.80	(22%) $154.00	(34%) $238.50	(42%) $293.30

When considering the testing of 50 persons per year in 12 different occupations, the costs are estimated to be approximately $35,000. Should the State assume the total cost, it would mean an investment of close to $700 in each candidate. In the three cost sharing options discussed above, the State would be

responsible for the greater share of the cost in each case: Option 1--78%, $538.10; Option 2--66%, $453.60; and Option 3--58%, $398.80. The candidate would be responsible for a smaller, but ascending, percentage of cost. Option 1--22%, $154.00; Option 2--34%, $238.50; Option 3--42%, $293.00.

The above data on cost sharing also suggest the logic of considering a cost sharing formula based on one of the following common proportions with minimal rounding: Option 1--75/25; Option 2--67/33; Option 3--50/50. Applying this model, the actual estimated cost per testee would be as shown in Table 4.

TABLE 4

Cost Sharing by Proportions

Option	Proportion	State	Candidate	Total
1	75/25	$517	$175	$692
2	67/33	462	230	692
3	50/50	346	346	692

VI. Recommendations

There has been much discussion and interest in the occupational competency testing element of the Occupational Specialist Certification program. The Advisory Committee, university personnel, local vocational administrators, and vocational teachers have contributed many ideas and suggestions for consideration--as has the formative assessments and the third party assessment (see Appendix I). The most meaningful and potent evidence has come from the experience of the pilot run. All of

these inputs, and more, have contributed to the following recommendations:

1. The Model. Despite the fact that the model piloted was predicated on what now appears to be a grossly inflated number of candidates, it is recommended that it be retained until the myriad of changes taking place in secondary education are settled in and better data is available on which to estimate vocational teacher needs.

   It is further recommended that in the interim, the central test site become the major focus of testing activity and that the north and south sites carry on in a more limited mode--concentrating on testing candidates in the occupations having the greater number of Occupational Specialists in service.

2. Information and Clarification. Since vocational teachers in the field and their administrators are not adequately informed about the requirement of occupational competency testing as a certification requirement, a concerted effort should be forthcoming to provide such information--and needed clarification.

3. Examination by Committee. It appears that there will be only a very few occupational specialist candidates whose occupational competency cannot be verified by the written and performance tests of NOCTI or those similar tests used for licensure by tradesmen, technicians, or professionals by certain state/national agencies or associations. Therefore,

it is recommended that, in those cases where such tests are not applicable, selected members of the Advisory Committee, supplemented by persons known to be proficient in the particular occupation, devise an appropriate testing procedure, test the candidate, collect other relevant information and report on their assessment to the Center director. The director will handle their report in the same manner as NOCTI test results for purposes of certification.

Since this procedure will be time consuming and costly in terms of time and effort expended, it is recommended that the candidate be required to pay the regular NOCTI test fee for this assessment.

4. Passing Criteria. Historically, Indiana has established that the candidate who earns a T-score of 40 or above on both the written and performance sections of the appropriate NOCTI test has provided evidence of occupational competency. That criterion appears to be working well. It is recommended that it be retained for the present. It is also recommended that written test T-scores and the performance test T-scores may be averaged to meet the criteria of T = 40 when the low score is within a standard error of measurement of the cut-off score.

5. Performance Examiners Workshop. In order to have uniformity and consistency in performance assessment, it is recommended that a performance assessment workshop be conducted each year. It is recommended that attendance be required by new

examiners and that State funding be provided to pay the attendees costs of travel, lodging, and meals. It is highly recommended that a stipend of $50.00 per day be provided to each attendee. After an individual has attended the workshop and has conducted a successful test session, he/she will become a Certified Master Performance Examiner.

6. Advisory Committee. It is recommended that the Indiana Occupational Competency Center establish and maintain an advisory committee to provide advice, information, and support for the director. It is further recommended that the committee include in its membership the designated teacher educators named in the consortium contract, a representative of the Division of Teacher Education and Certification, a representative of the Division of Vocational Education, a vocational education administrator, and a vocational education teacher.

7. State Funding for Center Operation. It is recommended that the State provide funding for the operation of the Indiana Occupational Competency Testing Center and the conducting of the annual performance assessment workshop as a minimum level of support. As of 1990-91, this will involve .25 FTE effort for the director and .25 FTE secretarial support. Thereafter, a 5-8% annual increase in salaries should be anticipated.

8. Candidate Cost Sharing. It is recommended that the candidates share in the costs of their test and its administra-

tion. It is recommended that the test fee be within the range of $150.00 and $250.00--with preference to Option 1 (Table 4) with the 75% State and 25% candidate proportion share which would set the candidate fee at $175.00.

9. Occupational Competency Testing Process by Teaching Endorsement. Three testing processes or modes have been recommended for use in the occupational competency testing element of the Occupational Specialist certification program. Since the vocational endorsement areas for which occupational specialist certification is applicable have been recently clarified, it is recommended that the process or mode indicated in Figure 2 be accepted as the approved mode for occupational specialist certification purpose.

Figure 2

Recommendation for Testing Process to
Demonstrate Competency by Teaching Endorsement Area

TEACHING ENDORSEMENT	TESTING PROCESS		
	NOCTI Test Number	State License Test	Test by Com.
AGRICULTURE (500)			
501 Agricultural Mechanics			X
502 Agricultural Production			X
503 Agricultural Resources			X
504 Agricultural Supply and Service			X
505 Forestry			X
506 Ornamental Horticulture			X
MARKETING EDUCATION (550)			
554 Fashion Merchandising			X
567 Hotel and Lodging			X
570 Radio/Television Broadcasting			X
572 Recreation and Tourism			X
579 Entrepreneurship/Small Business Ownership			X
HEALTH OCCUPATIONS (600)			
602 Dental Assistant		X	
603 Dental Laboratory		X	
608 Medical Laboratory Assistant		X	
610 Nurse's Aide		X	
616 Medical Assistant		X	
HOME ECONOMICS (650)			
651 Care and Guidance of Children	082		
652 Clothing Management, Production and Services			X
653 Food Management, Production and Services			X
654 Home Furnishings, Equipment and Services			X
655 Institutional and Home Management and Supporting Services			X
OFFICE EDUCATION (700)			
702 Business Data Processing	026,080, 084		

TEACHING ENDORSEMENT	TESTING PROCESS		
TRADE AND INDUSTRIAL (800)	NOCTI Test Number	State License Test	Test by Com.
804 Heating and Air Conditioning	006,044, 043		
805 Appliance Repair	027		
811 Automotive Mechanics	003		
812 Automotive Body Repair	002,083		
821 Aircraft Mechanics		X	
826 Business Machine Repair			X
827 Commercial Art	029		
829 Commercial Photography	070		
844 Masonry	009,054, 051		
845 Painting and Decorating	035		
849 Building Trades	007,042		
850 Custodial Services	025		
851 Diesel Mechanics	004,052		
852 Mechanical Drafting	060,013		
853 Architectural Drafting	012		
854 Building Maintenance	067,025		
861 Industrial Electronics	016,053		
864 Communication Electronics	015,055		
866 Computer Electronics			X
881 Drycleaning			X
882 Laundering			X
886 Graphic and Printing Communications	019,073		
922 Machine Shop	020,040		
924 Sheet Metal	011		
926 Welding and Cutting	021,041, 083		
941 Barbering		X	
942 Cosmetology		X	
952 Law Enforcement		X	
963 Meat Cutting			X
966 Precision Food Production	017,055		
969 Small Engine Repair	055,056		
981 Dressmaking			X
982 Tailoring			X
993 Furniture Making	024		

APPENDICES

Certified Master Performance Examiners/Facilitators ..... Appendix A

Certified Performance Test Facilities ..... Appendix B

Elkhart/South Bend Area Evaluation Sheet ..... Appendix C

Evaluation Sheet ..... Appendix D

Report of National Occupational Competency NOCTI Test Results ..... Appendix E

Interpretation of NOCTI Test Results ..... Appendix F

Appraisal of Occupational Competency by Committee ..... Appendix G

Project Advisory Committee ..... Appendix H

Third Party Assessment ..... Appendix I

APPENDIX A

Certified Performance Master Examiners

Auto Body Repair

Ric Burdine
Ben Davis High School
Indianapolis, Indiana

William Gardner
Charles A. Prosser Vocational Center
New Albany, Indiana

Robert Maloney
Elkhart Career Center
Elkhart, Indiana

Auto Mechanics

Kenneth Afterkirk
Charles A. Prosser Vocational Center
New Albany, Indiana

Gregory Bernhard
Ben Davis High School
Indianapolis, Indiana

Royce Foster
Ivy Tech - Lafayette
Lafayette, Indiana

Eugene Harsanyi
Elkhart Career Center
Elkhart, Indiana

Carpentry

Ralph Best
Charles A. Prosser Vocational Center
New Albany, Indiana

Louis DeFreese
Elkhart Career Center
Elkhart, Indiana

Doug Sisk
Ben Davis High School
Indianapolis, Indiana

Commercial Photography

Al Meloy
Ivy Tech - Northcentral
South Bend, Indiana

Computer Technology

Russell Essex
Austin E. Walker Career Center
Indianapolis, Indiana

Rick Haws
Charles A. Prosser Vocational Center
New Albany, Indiana

Diesel Engine Repair

Keith Cooper
Ivy Tech - Lafayette
Lafayette, Indiana

Electrical Installation

Edward Crowe
Ivy Tech - Southcentral
Sellersburg, Indiana

Electronics Technology

Mike Durren
Ivy Tech - Northcentral
South Bend, Indiana

Roy Wildt, Jr.
Ben Davis High School
Indianapolis, Indiana

Machine Drafting

George Bliha
Elkhart Career Center
Elkhart, Indiana

Machine Trades

William Campton
Central Nine Vocational-Technical School
Greenwood, Indiana

Robert Dietrich
Charles A. Prosser Vocational Center
New Albany, Indiana

Neil Klockow
Elkhart Career Center
Elkhart, Indiana

Printing (Offset)

Silvano Salvatory
Charles A. Prosser Vocational Center
New Albany, Indiana

Quantity Foods Preparation

Richard Bishop
Ben Davis High School
Indianapolis, Indiana

Small Engine Repair

Rex Thwaits
Elkhart Career Center
Elkhart, Indiana

Welding

Richard Foster
Central Nine Vocational-Technical School
Greenwood, Indiana

Larry Hensley
Great Clark County Schools
Jeffersonville, Indiana

Robert O'Connor
Elkhart Career Center
Elkhart, Indiana

APPENDIX B

Certified Performance Test Facilities

Occupations	Institution	Location
Auto Body Repair	Ben Davis High School	Indianapolis
	Prosser Career Center	New Albany
	Elkhart Career Center	Elkhart
Auto Mechanics	Ben Davis High School	Indianapolis
	Elkhart Career Center	Elkhart
	IVTC - Lafayette	Lafayette
	Prosser Career Center	New Albany
Carpentry	Ben Davis High School	Indianapolis
	Elkhart Career Center	Elkhart
	Prosser Career Center	New Albany
Commercial Photography	IVTC - South Bend	South Bend
Computer Technology	Walker Career Center	Indianapolis
	Prosser Career Center	New Albany
Diesel Engine Repair	IVTC - Lafayette	Lafayette
Electrical Installation	IVTC - Southcentral	Sellersburg
Electronics Technology	Ben Davis High School	Indianapolis
	IVTC - South Bend	South Bend
Machine Drafting	Elkhart Career Center	Elkhart
Machine Trades	Elkhart Carer Center	Elkhart
	Prosser Career Center	New Albany
	Central Nine Area Voc School	Greenwood
Printing (Offset)	Prosser Career Center	New Albany

Quantity Food Preparation	Ben Davis High School	Indianapolis
Small Engine Repair	Elkhart Career Center	Elkhart
Welding	Elkhart Career Center	Elkhart
	Central Nine Area Voc School	Greenwood
	Prosser Career Center	New Albany

APPENDIX C

INDIANA NOCTI PILOT TESTING PROJECT

Purdue University

Elkhart/South Bend Area Evaluation Sheet

Evaluator _____

CARPENTRY

	SUPERIOR	OUTSTANDING	GOOD	ADEQUATE	FAIR	POOR
Physical space to conduct test	O	O	O	O	O	O
Equipment, tools, materials on hand	O	O	O	O	O	O
Laboratory organization	O	O	O	O	O	O
Rapport between performance examiner and candidate	O	O	O	O	O	O
Environment conducive to test taking	O	O	O	O	O	O

Please provide at least one appropriate remark about this testing procedure.

_____

_____

_____

_____

AUTO MECHANICS

	SUPERIOR	OUTSTANDING	GOOD	ADEQUATE	FAIR	POOR
Physical space to conduct test	O	O	O	O	O	O
Equipment, tools, materials on hand	O	O	O	O	O	O
Laboratory organization	O	O	O	O	O	O
Rapport between performance examiner and candidate	O	O	O	O	O	O
Environment conducive to test taking	O	O	O	O	O	O

Please provide at least one appropriate remark about this testing procedure.

_____

_____

_____

_____

AUTO BODY

	SUPERIOR	OUTSTANDING	GOOD	ADEQUATE	FAIR	POOR
Physical space to conduct test	O	O	O	O	O	O
Equipment, tools, materials on hand	O	O	O	O	O	O
Laboratory organization	O	O	O	O	O	O
Rapport between performance examiner and candidate	O	O	O	O	O	O
Environment conducive to test taking	O	O	O	O	O	O

Please provide at least one appropriate remark about this testing procedure.

_____

_____

_____

APPENDIX D

INDIANA NOCTI PILOT TESTING PROGRAM

Purdue University

Evaluation Sheet

Evaluator _____ (optional)

		Low ---------- High				
1.	Adequate information provided about the nature of the test.....	1	2	3	4	5
2.	Provided adequate directions to test site....	1	2	3	4	5
3.	Test monitors were friendly and helpful.....	1	2	3	4	5
4.	Test areas were conducive to good performance.....	1	2	3	4	5
5.	Tools, materials, and equipment available and in good condition.....	1	2	3	4	5
6.	Was treated fairly and with respect.....	1	2	3	4	5
7.	Adequate directions for completing test were provided.....	1	2	3	4	5
8.	Overall rating of the organization and conduct of NOCTI testing.....	1	2	3	4	5

Please provide at least one appropriate remark about the structure and process of this testing procedure.

_____

_____

_____

APPENDIX E

Name _____

SS# _____

Occupation _____

Date Taken _____

REPORT OF NATIONAL OCCUPATIONAL COMPETENCY (NOCTI) TEST RESULTS

YOUR RESULTS

	Written Exam	Performance Exam
Raw Score	_____	_____
z-score	_____	_____
T-score	_____	_____

NATIONAL NORMS

Mean	_____	_____
Std Dev	_____	_____
Std Err	_____	_____

NOTE: Should you want a more detailed analysis of your test results or desire interpretation of the above data, please feel free to contact me. I'm available by phone or by visit to my office. If you choose the latter, please make an appointment in order that I will be in when you arrive.

Max Eddy
Professor, Industrial Technology, and
Area (Indiana) Test Coordinator, NOCTI

Address: Department of Industrial Technology
371 Knoy Hall
Purdue University
West Lafayette, IN 47907

Phone: (317) 494-1096

APPENDIX F

INTERPRETATION OF NOCTI TEST RESULTS

There has been an agreement that the NOCTI test results will be reported and interpreted in terms of "T-scores". A T-score results when raw scores are transposed to a scale which has a mean (average) of 50 and a standard deviation of 10.

The formula for the transposition is as follows:

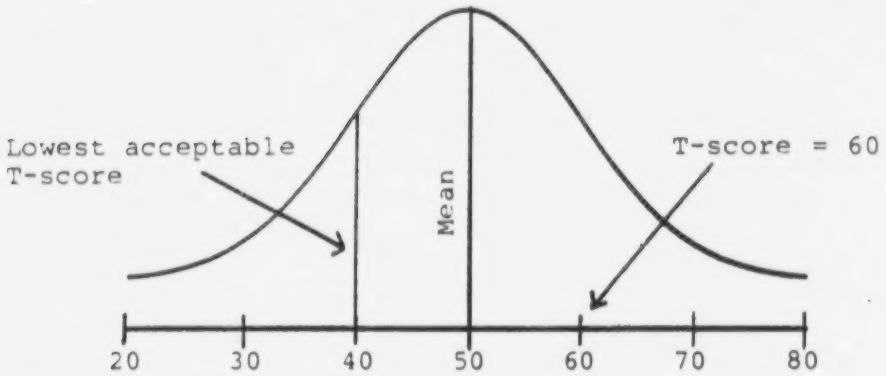
$$\text{T-score} = \frac{\text{Raw score - national mean}}{\text{Standard deviation}} \times 10 + 50$$

Example: Raw score = 80
National mean = 70
Standard deviation = 10

$$\text{T-score} = \left(\frac{80-70}{10}\right) 10 + 50$$

$$= \left(\frac{10}{10}\right) \times 10 + 50$$

$$= 1 \times 10 + 50$$



In this case, your score would have been 60, which is one standard deviation above the national mean -- good!

Indiana vocational teachers are expected to earn T-scores of 40 or above on both written and performance NOCTI tests.

APPENDIX G

Appraisal of Occupational Competency by Committee

Name _____

Occupation _____

Date _____

Check items required of candidate.

____ 1. Document occupational experience--minimum 3 years, use form provided.

____ 2. Take performance test devised by committee.

____ 3. Take written test, if one is available.

____ 4. Provide copy of license(s) relating to occupational practice.

____ 5. Provide transcript of trade, technical, or professional school credits and related diplomas and/or degrees.

____ 6. Provide score report of state or nationally normed tests on which license is based.

____ 7. Provide names of 3 or more employers and/or supervisors who can attest to your proficiency.

____ 8. Provide names of 3 or more work peers who can attest to your proficiency.

____ 9. Take oral examination by occupational peers.

____ 10. Provide record of technical, related short courses, seminars or workshops attended--certificates desirable.

____ 11. Verify commendations, prizes, competitive awards related to occupational specialty.

____ 12. Copy of publications, books, and/or articles related to occupational specialty.

____ 13. If teaching, student evaluation of performance as an instructor.

____ 14. If teaching, provide copy of superior's evaluation and letter relating to technical competence for teaching specialty.

____ 15. Evidence of employment as a technical consultant to business or industry in technical specialty--description, contract, agreement.

____ 16. Evidence of apprenticeship completion.

____ 17. Where self employment is involved, provide names of clients or customers who can attest to proficiency.

____ 18. Other evidence of occupational competency or recognition.

APPENDIX H

Project Advisory Committee

Dr. Lowell D. Anderson, Chairperson
Industrial Education Department
Indiana Sate University
Terre Haute, IN 47809

Dr. Donald D. Buskirk
Department of Industrial Technology
369 Knoy Hall
Purdue University
West Lafayette, IN 47907

Dr. Max Eddy
Department of Industrial Technology
371 Knoy Hall
Purdue University
West Lafayette, IN 47907

Mr. Larry Foster, Director
Kokomo Area Vocational School
303 East Superior Street
Kokomo, IN 46901

Dr. Robert C. Harris
Vocational Education Program
Smith Research Center, Room 126
Indiana University
Bloomington, IN 47405

Mr. Kenneth Heifner, Manufacturing Training Coordinator
Inland Fisher Guide
Division of General Motors
P.O. Box 2459
Anderson, IN 46018

Ms. Susan Koebcke, Assistant Principal
Muncie Area Career Center
2501 Oakwood Avenue
Muncie, IN 47304

Dr. James Nitsos
Teacher Education and Certification
State House, Room 229
Indianapolis, IN 46204-2798

Dr. Donald F. Smith, Chairperson
Department of Industry and Technology
2000 University Avenue, P.A. 131
Ball State University
Muncie, IN 47306

Mr. Keith Truesdell
Wayne Township Area Vocational School
M.S.D. Wayne Township
1220 South High School Road
Indianapolis, IN 46241

APPENDIX I

NATIONAL OCCUPATIONAL COMPETENCY TESTING INSTITUTE

409 Bishop Hall • Ferris State University • Big Rapids, Michigan 49307
(616) 796-4695

DR. SCOTT D. WHITENER
Executive Director

July 9, 1990

Dr. Max Eddy
Purdue University
Dept. of Industrial Technology
Knoy Hall
West Lafayette, IN 47907

Dear Max:

As requested, I have completed a very thorough third party review of the Indiana Project "Professional Development for Occupational Specialist: Occupational Competency Testing.". Attached please find my report.

I appreciated being called on to provide this review as it was enjoyable to be involved with such an exciting and well executed endeavor. As I said in my report, you, your staff and all those involved in this project are to be congratulated on a job extremely well done. Little in education is more important than ensuring teacher competency and you and your staff can take pride in knowing that your efforts were instrumental in establishing a first-rate teacher testing program for vocational teachers in your great state.

If after reviewing my report you have any questions or I may be of service in any way, please don't hesitate to call on me. I am excited about the testing program in Indiana and am eager to assist.

Once again, thank you for involving me in your very successful project. Good luck as you proceed with implementation. I shall look forward to seeing you again soon.

Sincerely,

Scott D. Whitener
Executive Director

po

Attachment

THIRD PARTY ASSESSMENT OF PROFESSIONAL DEVELOPMENT FOR OCCUPATIONAL SPECIALIST: OCCUPATIONAL COMPETENCY TESTING

by Scott D. Whitener
Executive Director
National Occupational Competency Testing Institute
and Dean, College of Education
Ferris State University

In preparation for this third party assessment, I thoroughly reviewed all project reports including four quarterly reports dated June 15 and Sept. 29, 1989 and Jan. 29 and May 22, 1990 as well as the "Project Final Report" and "Indiana Occupational Competency Testing Center Operation -- Policy Manual 1990". I found all of these materials to be very clear, concise and accurate. They did an excellent job of documenting the project and reflected the upmost in organization and planning.

Few things that we do today pertaining to education are more important than ensuring that teachers are competent in the subject matter they teach. In order to design and implement a statewide high caliber teacher testing system, particularly in occupational education where a performance test must be involved, great forethought and planning are required. A lack of organization, inconsistencies, poor standards or failure to capitalize on the experiences others have had, spells disaster for a teacher testing program. Clearly, upon review, this project was conducted in a first-rate fashion, was enormously successful and provides an excellent foundation for a first-rate state teacher testing program.

Although off to a slow start, the project picked up momentum rapidly. More importantly, an excellent plan of action was designed and precisely implemented which permitted the project to move forward in the most productive fashion. An advisory committee made up of key individuals throughout Indiana was established which is central to the success of such endeavors. A complete national literature review was performed to seek out competency test vehicles. Prior to any testing, project staff visited other teacher testing centers to learn all they could from what others were doing so as to benefit from their experience and wisdom. Clearly, this was an essential activity.

A key component of this project was the actual pilot administration of occupational competency examinations to teacher candidates which project staff conducted in an outstanding fashion. Potential master examiners were carefully selected based on specific criteria. Written and performance sites were selected in accordance with established specifications. Examiners were subjected to state-of-the-art examiners training presented by one of the best NOCTI trainers in this country. Finally, the advisory committee was involved in every aspect of the pilot. The outcome was an exceptional pilot administration from which the project staff gleamed much knowledge critical to the establishment of a state policy manual.

The policy manual created through this project is among the finest I have seen. It is based upon not only the pilot test experiences in Indiana, it reflects years of experiences others have had around the country in similar testing operations. Certainly, no testing policy manual is beyond improvement, however, this manual is excellent and is precisely what is needed to begin a first-rate statewide occupational competency testing operation. The manual includes a very acceptable, detailed procedure to competency test those teachers who teach in areas for which there is no NOCTI or state license exam. This is a procedure which is often overlooked, but essential. Project staff are to be commended for having the forethought of including this as policy.

Pilot test results were as predicted which validated the quality of the tests and procedures used. Those candidates who were predicted to pass based on the Indiana cut score, did so; while those not expected to pass, did not. The pilot pointed out to both the advisory committee and project staff areas that needed to be altered in the test administration procedures which they readily acknowledged.

Contained within the final report is a cost and price analysis pertaining to the sharing of occupational competency testing costs between the candidate and the state. This analysis is one of the best I have seen. It further clearly points out the excellent value in teacher testing, particularly the high productivity in relation to low cost the test center was able to demonstrate. Regarding candidate out-of-pocket costs, I would recommend they be held to under $300 if possible and that the additional costs be underwritten by the state through a grant to the IOCTC.

Overall, I would consider the Indiana Occupational Competency Testing Center Project to be among the finest of such endeavors ever conducted nationally. Project staff, as well as the advisory committee, state staff and all those involved in the pilot test are to be congratulated on a job extremely well done. I would make absolutely no recommendations beyond those provided in the final report by project staff.

The objective of the Professional Development for Occupational Specialist Project was to expand the organization, scope and activities of the Indiana Occupational Competency Testing Center in order to accommodate new certification requirements for vocational teachers. The project not only accomplished its objective in a first-rate fashion, it provides the foundation for what could be considered a model statewide teacher testing system. With appropriate funding, it is ready to be operational and put Indiana at the forefront of the occupational competency testing of vocational teachers. Other states should follow Indiana's lead.